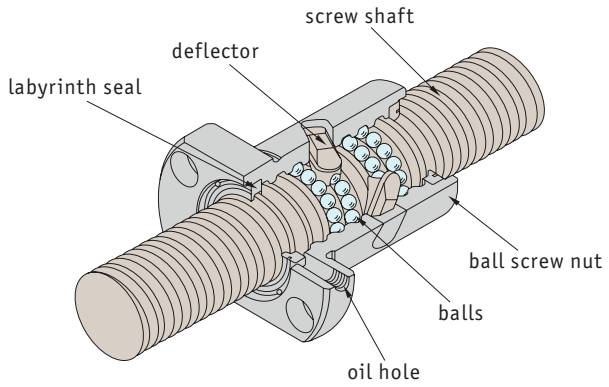



L1370


L1388


L1375


L1390

Standard ball screws


L1370


L1371


L1372


L1373

Miniature ball screws


L1379.F


L1379.C

Rolled ball screws

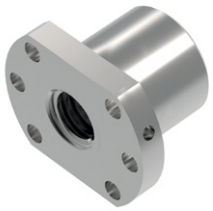
	Pitch (travel per revolution)						
Ø	5	10	16	20	25	40	50
16	●	●	●				
20	●	●		●			
25	●	●			●		
32	●	●		●			
40	●	●		●		●	
50		●		●			●
63		●		●			
80		●		●			

Miniature ball screws

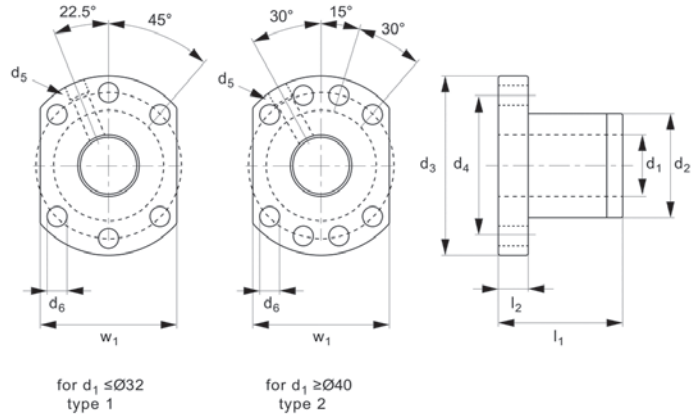
	Pitch (travel per revolution)					
Ø	1	2	2.5	4	5	Nut
6	●					flanged
8	●	●	●			flanged
10		●		●		flanged/cylinder
12		●		●	●	flanged/cylinder
14		●				flanged/cylinder

Left Hand Flanged Ball Nuts

DIN 69051, form B



L1370.L



Material

Steel (16MnCr5 or 100Cr6), with Vulkolan seals.

Technical Notes

To DIN 69051 form B.
Axial play for 5mm pitch = 0,05mm; for 10mm pitch = 0,10mm; for multi-starts = 0,20mm.
Preload max. 5% of max. dynamic load.

For axial run-out, concentricity and parallelism figures see technical pages.
With lubrication and fixing holes.
For use with ball screws no. L1375.

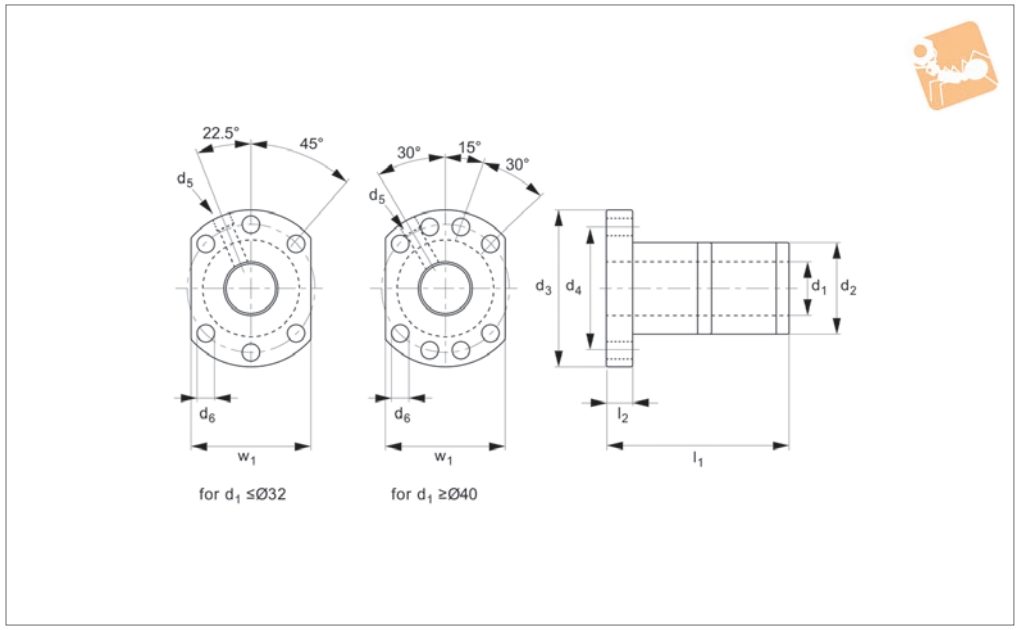
Tips

For easy mounting of the ball screw nuts see the nut bracket - part L1377.
For miniature ball screws Ø6 to Ø14 see part no. L1379.

Important Notes

Fit ball nut to screw using the sleeve provided. Offer up the ball nut to the screw and slide carefully on. Do not remove the ball nut from the sleeve provided - the ball bearings can come loose rendering the ball nut unusable.

Order No.	Lead	d_1 for screw	Type	l_1	d_2 tol. G6	d_3 ±0.15	d_4 ±0.15	d_5 for	d_6	l_2	w_1 ±0.15	Ball dia.	Dyn. load C kN max.	Static load C_0 kN max.	Stiffness N/µm
L1370.16L-05	5	16	Type 1	45	28	48	38	M 6	5,5	10	40	3,175	13,53	29,92	314
L1370.16L-10	10	16	Type 1	57	28	48	38	M 6	5,5	10	40	3,175	10,82	23,55	255
L1370.20L-05	5	20	Type 1	51	36	58	47	M 6	6,6	10	44	3,175	15,21	38,00	382
L1370.25L-05	5	25	Type 1	51	40	62	51	M 6	6,6	10	48	3,175	16,91	48,09	441
L1370.25L-10	10	25	Type 1	80	40	62	51	M 6	6,6	12	48	4,762	28,96	71,54	490
L1370.32L-05	5	32	Type 1	52	50	80	65	M 6	9,0	12	62	3,175	18,85	62,21	529
L1370.32L-10	10	32	Type 1	85	50	80	65	M 6	9,0	12	62	6,350	47,12	119,72	598
L1370.40L-05	5	40	Type 2	55	63	93	78	M 8	9,0	14	70	3,175	20,69	78,34	617
L1370.40L-10	10	40	Type 2	88	63	93	78	M 8	9,0	14	70	6,340	52,95	152,00	715
L1370.50L-10	10	50	Type 2	88	75	110	93	M 8	11,0	16	85	6,350	58,88	192,35	833
L1370.63L-10	10	63	Type 2	93	90	125	108	M 8	11,0	18	95	6,350	65,89	248,68	970
L1370.80L-10	10	80	Type 2	93	105	145	125	M 8	13,5	20	110	6,350	72,04	313,36	1068



L1371.L

Material
Steel (16MnCr5 or 100Cr6), with Vulkolan seals.

Technical Notes
Axial play for 5mm pitch = 0,05mm; for 10mm pitch = 0,10mm; for multi-starts = 0,20mm.
Preload max. 5% of max. dynamic load.

For axial run-out, concentricity and parallelism figures see technical pages.
With lubrication and fixing holes.
For use with ball screws no. L1375.

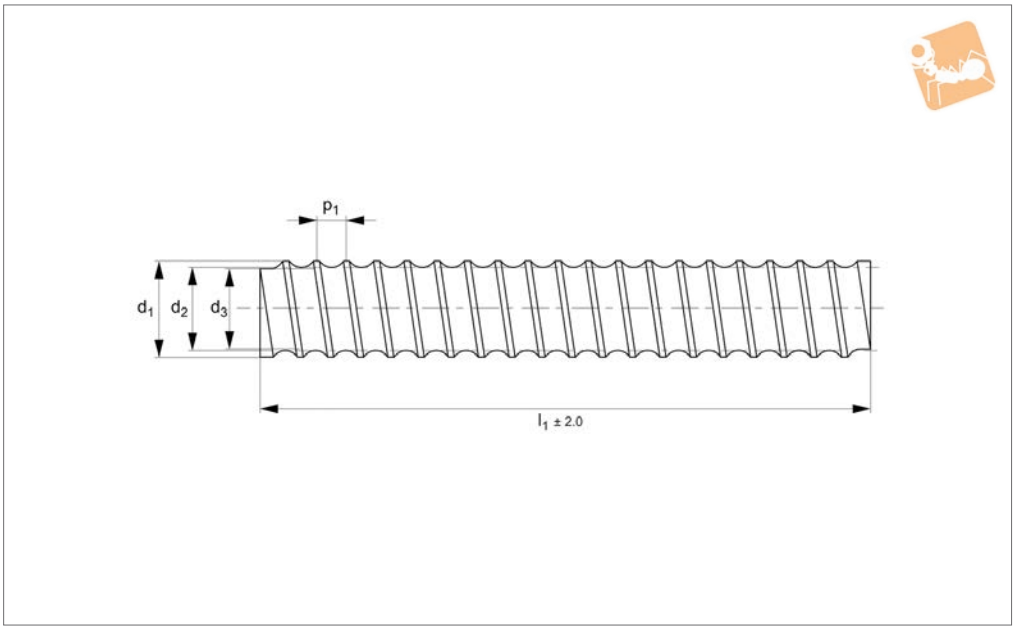
Tips
For miniature ball screws Ø6 to Ø14 see part no. L1379.

Important Notes
Fit ball nut to screw using the sleeve provided. Offer up the ball nut to the screw and slide carefully on. Do not remove the ball nut from the sleeve provided - the ball bearings can come loose rendering the ball nut unusable.

Order No.	d_1 for screw	Pitch	l_1	d_2 tol. G6	d_3	d_4	d_5 for	d_6	l_2	w_1 ±0.15	Ball dia.	Dyn. load C kN max.	Static load C_0 kN max.	Stiffness N/µm
L1371.16L-05	16	5	100	28	48	38	M 6	5.5	10	40	3.175	13.53	29.93	431
L1371.20L-05	20	5	101	36	55	47	M 6	7.0	10	44	3.175	15.21	38.00	519
L1371.25L-05	25	5	101	40	62	51	M 6	7.0	10	48	3.175	16.91	48.09	608
L1371.32L-05	32	5	102	50	70	65	M 6	7.0	12	62	3.175	18.85	62.21	725
L1371.32L-10	32	10	162	50	80	65	M 8	7.0	12	62	6.350	47.12	119.72	804
L1371.40L-05	40	5	105	63	80	78	M 6	7.0	14	70	3.175	20.69	78.34	853
L1371.40L-10	40	10	165	63	95	78	M 8	9.0	14	70	6.350	52.92	152.00	970
L1371.50L-10	50	10	171	75	110	93	M 8	11.0	16	85	6.350	58.88	192.35	1147

Left Hand Ø16 Ball Screws
rolled

L1375.16L



Material
Steel (CF53 or C55R), induction hardened to 60 HRC ±2, polished.

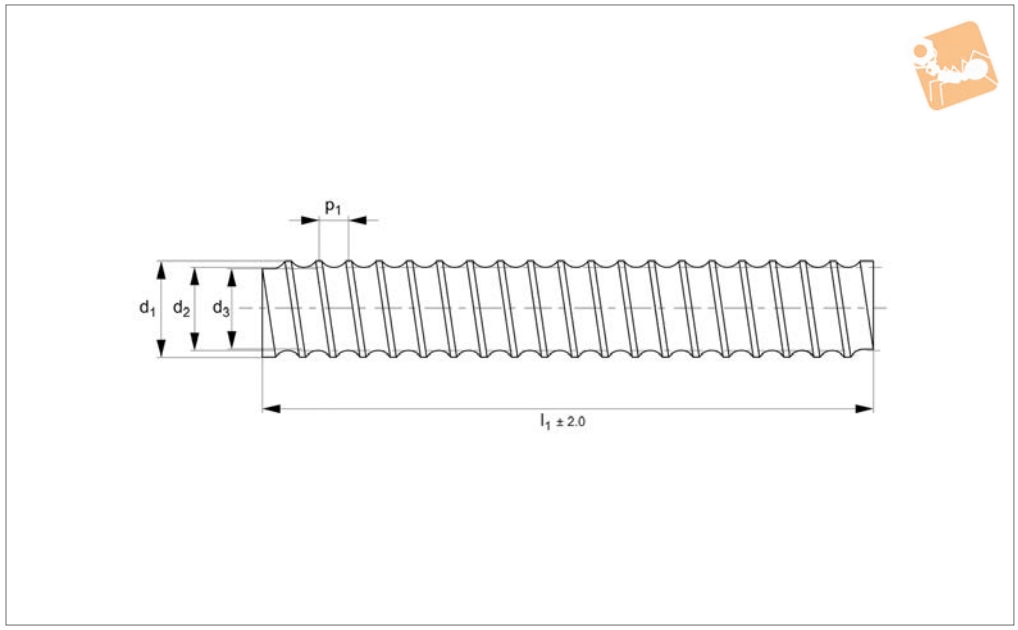
Technical Notes
Gothic profile with a 5 or 10mm lead. Tolerance T7 - 50µ/300mm. Shorter lengths or longer lengths up to a maximum of 3000mm available.

For ball screw nuts see parts L1370.L& L1371.L - these are left hand nuts.
For end screw machining to suit ball screw support units see relevant ball screw supports (L1388-L1406). End machining on request.

Tips
These are non-standard left hand thread ball screws.

Important Notes
Ensure the ball nut can be fitted to the ball screw after machining. Do not remove the ball nut from the sleeve prior to installation - the balls come free rendering the ball nut unusable.

Order No.	Screw dia. x lead	Lead	d_1	l_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.16L-05-0500	16x 5	5	17.08	500	16	13.90	$4{,}45x10^{-5}$	0.71
L1375.16L-05-0600	16x 5	5	17.08	600	16	13.90	$4{,}45x10^{-5}$	0.85
L1375.16L-05-0800	16x 5	5	17.08	800	16	13.90	$4{,}45x10^{-5}$	1.13
L1375.16L-05-1000	16x 5	5	17.08	1000	16	13.90	$4{,}45x10^{-5}$	1.41
L1375.16L-05-1500	16x 5	5	17.08	1500	16	13.90	$4{,}45x10^{-5}$	2.12
L1375.16L-05-2000	16x 5	5	17.08	2000	16	13.90	$4{,}45x10^{-5}$	2.82
L1375.16L-05-2500	16x 5	5	17.08	2500	16	13.90	$4{,}45x10^{-5}$	3.53
L1375.16L-05-3000	16x 5	5	17.08	3000	16	13.90	$4{,}45x10^{-5}$	4.23



L1375.20L

Material
Steel (CF53 or C55R), induction hardened to 60 HRC ±2, polished.

Technical Notes
Gothic profile with a 5,20 or 50mm lead. Tolerance T7 - 50µ/300mm. Shorter lengths or longer lengths up to a maximum of 3000mm available.
For ball screw nuts see parts L1370.L & L1371.L - these are left hand nuts.
For end screw machining to suit ball screw support units see relevant ball screw supports (L1388-L1406). End machining on request.
Also available as a left hand thread for 5mm pitch.

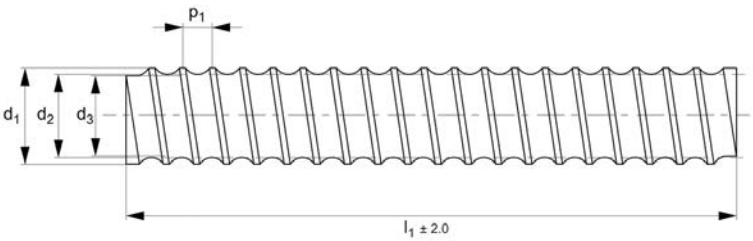
Tips
These are non-standard left hand thread ball screws.

Important Notes
Ensure the ball nut can be fitted to the ball screw after machining. Do not remove the ball nut from the sleeve prior to installation - the balls come free rendering the ball nut unusable.

Order No.	Screw dia. x lead	d_1	l_1	Lead w_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.20L-05-0500	20x 5	21.08	500	5	20	17.9	$1{,}12x10^{-4}$	1.18
L1375.20L-05-0600	20x 5	21.08	600	5	20	17.9	$1{,}12x10^{-4}$	1.41
L1375.20L-05-0800	20x 5	21.08	800	5	20	17.9	$1{,}12x10^{-4}$	1.88
L1375.20L-05-1000	20x 5	21.08	1000	5	20	17.9	$1{,}12x10^{-4}$	2.35
L1375.20L-05-1500	20x 5	21.08	1500	5	20	17.9	$1{,}12x10^{-4}$	3.53
L1375.20L-05-2000	20x 5	21.08	2000	5	20	17.9	$1{,}12x10^{-4}$	4.70
L1375.20L-05-2500	20x 5	21.08	2500	5	20	17.9	$1{,}12x10^{-4}$	5.88
L1375.20L-05-3000	20x 5	21.08	3000	5	20	17.9	$1{,}12x10^{-4}$	7.05

Left Hand Ø 25 Ball Screws
rolled

L1375.25L



Material
Steel (CF53 or C55R), induction hardened to 60 HRC ±2, polished.

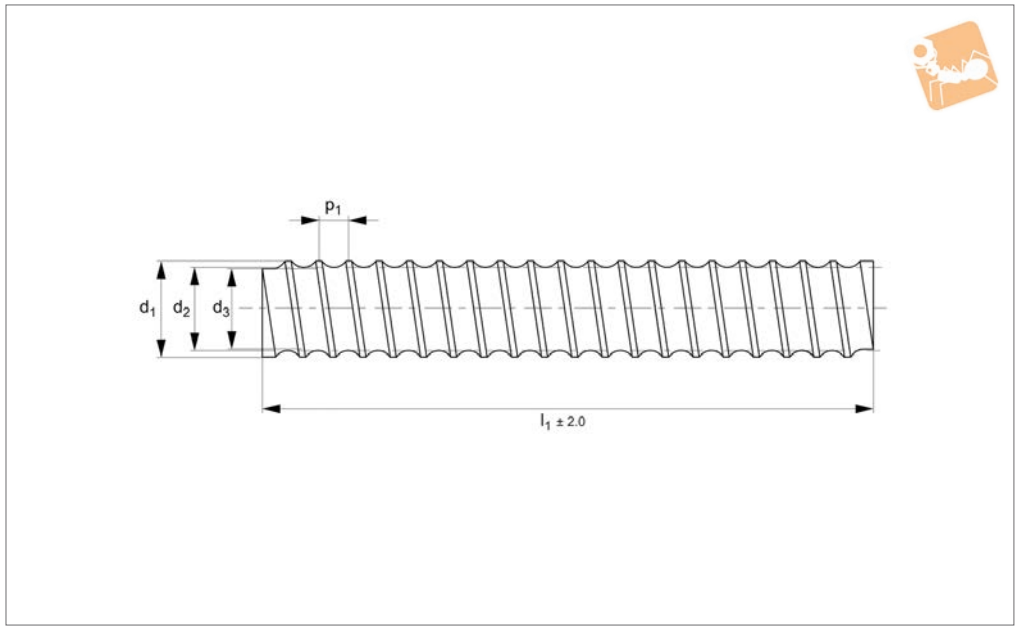
Technical Notes
Gothic profile with a 5,10 or 2mm lead. Tolerance T7 - 50µ/300mm. Shorter lengths or longer lengths up to a maximum of 6000mm available.

For ball screw nuts see parts L1370.L & L1371.L - these are left hand nuts.
For end screw machining to suit ball screw support units see relevant ball screw supports (L1388-L1406). End machining on request.

Tips
These are non-standard left hand thread ball screws.

Important Notes
Ensure the ball nut can be fitted to the ball screw after machining. Do not remove the ball nut from the sleeve prior to installation - the balls come free rendering the ball nut unusable.

Order No.	Screw dia. x lead	d_1	l_1	Lead w_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.25L-05-0500	25x 5	26.08	500	5	25	22.9	$2{,}62\times10^{-4}$	1.80
L1375.25L-05-0600	25x 5	26.08	600	5	25	22.9	$2{,}62\times10^{-4}$	2.15
L1375.25L-05-0800	25x 5	26.08	800	5	25	22.9	$2{,}62\times10^{-4}$	2.87
L1375.25L-05-1000	25x 5	26.08	1000	5	25	22.9	$2{,}62\times10^{-4}$	3.59
L1375.25L-05-1500	25x 5	26.08	1500	5	25	22.9	$2{,}62\times10^{-4}$	5.39
L1375.25L-05-2000	25x 5	26.08	2000	5	25	22.9	$2{,}62\times10^{-4}$	7.18
L1375.25L-05-2500	25x 5	26.08	2500	5	25	22.9	$2{,}62\times10^{-4}$	8.98
L1375.25L-05-3000	25x 5	26.08	3000	5	25	22.9	$2{,}62\times10^{-4}$	10.77
L1375.25L-05-3500	25x 5	26.08	3500	5	25	22.9	$2{,}62\times10^{-4}$	2.87
L1375.25L-05-4000	25x 5	26.08	4000	5	25	22.9	$2{,}62\times10^{-4}$	3.59
L1375.25L-05-4500	25x 5	26.08	4500	5	25	22.9	$2{,}62\times10^{-4}$	5.39
L1375.25L-05-5000	25x 5	26.08	5000	5	25	22.9	$2{,}62\times10^{-4}$	7.18
L1375.25L-05-5500	25x 5	26.08	5500	5	25	22.9	$2{,}62\times10^{-4}$	8.98
L1375.25L-05-6000	25x 5	26.08	6000	5	25	22.9	$2{,}62\times10^{-4}$	10.77
L1375.25L-10-0500	25x10	26.08	500	10	25	22.9	$2{,}62\times10^{-4}$	1.80
L1375.25L-10-0600	25x10	26.08	600	10	25	22.9	$2{,}62\times10^{-4}$	2.15
L1375.25L-10-0800	25x10	26.08	800	10	25	22.9	$2{,}62\times10^{-4}$	2.87
L1375.25L-10-1000	25x10	26.08	1000	10	25	22.9	$2{,}62\times10^{-4}$	3.59
L1375.25L-10-1500	25x10	26.08	1500	10	25	22.9	$2{,}62\times10^{-4}$	5.39
L1375.25L-10-2000	25x10	26.08	2000	10	25	22.9	$2{,}62\times10^{-4}$	7.18
L1375.25L-10-2500	25x10	26.08	2500	10	25	22.9	$2{,}62\times10^{-4}$	8.98
L1375.25L-10-3000	25x10	26.08	3000	10	25	22.9	$2{,}62\times10^{-4}$	10.77
L1375.25L-10-3500	25x10	26.08	3500	10	25	22.9	$2{,}62\times10^{-4}$	2.87
L1375.25L-10-4000	25x10	26.08	4000	10	25	22.9	$2{,}62\times10^{-4}$	3.59
L1375.25L-10-4500	25x10	26.08	4500	10	25	22.9	$2{,}62\times10^{-4}$	5.39
L1375.25L-10-5000	25x10	26.08	5000	10	25	22.9	$2{,}62\times10^{-4}$	7.18
L1375.25L-10-5500	25x10	26.08	5500	10	25	22.9	$2{,}62\times10^{-4}$	8.98
L1375.25L-10-6000	25x10	26.08	6000	10	25	22.9	$2{,}62\times10^{-4}$	10.77



L1375.32L

Material
Steel (CF53 or C55R), induction hardened to 60 HRC ±2, polished.

Technical Notes
Gothic profile with a 5,10,20 or 40mm lead.
Tolerance T7 - 50µ/300mm. Shorter lengths or longer lengths up to a maximum of 6000mm available.
For ball screw nuts see parts L1370.L & L1371.L - these are left hand nuts.
For end screw machining to suit ball screw support units see relevant ball screw supports (L1388-L1406). End machining on request.
Also available as a left hand thread for 5mm pitch.

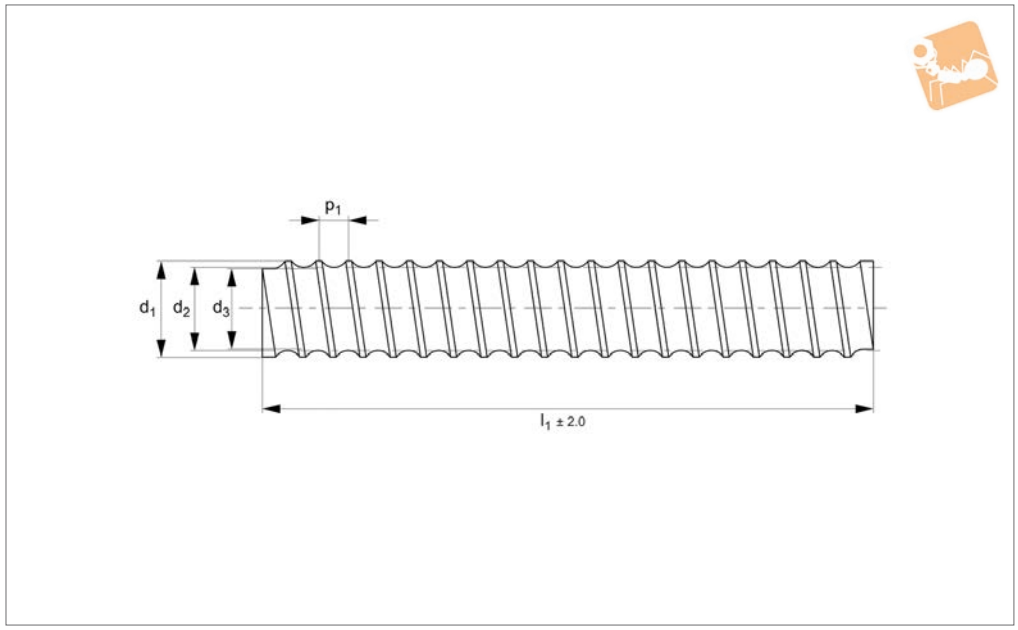
Tips
These are non-standard left hand thread ball screws.

Important Notes
Ensure the ball nut can be fitted to the ball screw after machining. Do not remove the ball nut from the sleeve prior to installation - the balls come free rendering the ball nut unusable.

Order No.	Screw dia. x lead	d_1	l_1	Lead w_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.32L-05-0500	32x 5	33.08	500	5	32	29.9	$7{,}25x10^{-4}$	2.99
L1375.32L-05-0600	32x 5	33.08	600	5	32	29.9	$7{,}25x10^{-4}$	3.59
L1375.32L-05-0800	32x 5	33.08	800	5	32	29.9	$7{,}25x10^{-4}$	4.78
L1375.32L-05-1000	32x 5	33.08	1000	5	32	29.9	$7{,}25x10^{-4}$	5.98
L1375.32L-05-1500	32x 5	33.08	1500	5	32	29.9	$7{,}25x10^{-4}$	8.97
L1375.32L-05-2000	32x 5	33.08	2000	5	32	29.9	$7{,}25x10^{-4}$	11.96
L1375.32L-05-2500	32x 5	33.08	2500	5	32	29.9	$7{,}25x10^{-4}$	14.95
L1375.32L-05-3000	32x 5	33.08	3000	5	32	29.9	$7{,}25x10^{-4}$	17.94
L1375.32L-05-3500	32x 5	33.08	3500	5	32	29.9	$7{,}25x10^{-4}$	4.78
L1375.32L-05-4000	32x 5	33.08	4000	5	32	29.9	$7{,}25x10^{-4}$	5.98
L1375.32L-05-4500	32x 5	33.08	3500	5	32	29.9	$7{,}25x10^{-4}$	8.97
L1375.32L-05-5000	32x 5	33.08	4000	5	32	29.9	$7{,}25x10^{-4}$	11.96
L1375.32L-05-5500	32x 5	33.08	4500	5	32	29.9	$7{,}25x10^{-4}$	14.95
L1375.32L-05-6000	32x 5	33.08	6000	5	32	29.9	$7{,}25x10^{-4}$	17.94
L1375.32L-10-0500	32x10	34.15	500	10	32	27.8	$7{,}69x10^{-4}$	3.08
L1375.32L-10-0600	32x10	34.15	600	10	32	27.8	$7{,}69x10^{-4}$	3.70
L1375.32L-10-0800	32x10	34.15	800	10	32	27.8	$7{,}69x10^{-4}$	4.93
L1375.32L-10-1000	32x10	34.15	1000	10	32	27.8	$7{,}69x10^{-4}$	6.16
L1375.32L-10-1500	32x10	34.15	1500	10	32	27.8	$7{,}69x10^{-4}$	9.24
L1375.32L-10-2000	32x10	34.15	2000	10	32	27.8	$7{,}69x10^{-4}$	12.32
L1375.32L-10-2500	32x10	34.15	2500	10	32	27.8	$7{,}69x10^{-4}$	15.40
L1375.32L-10-3000	32x10	34.15	3000	10	32	27.8	$7{,}69x10^{-4}$	18.48
L1375.32L-10-3500	32x10	33.08	3500	10	32	29.9	$7{,}25x10^{-4}$	4.78
L1375.32L-10-4000	32x10	33.08	4000	10	32	29.9	$7{,}25x10^{-4}$	5.98
L1375.32L-10-4500	32x10	33.08	4500	10	32	29.9	$7{,}25x10^{-4}$	8.97
L1375.32L-10-5000	32x10	33.08	5000	10	32	29.9	$7{,}25x10^{-4}$	11.96

Left Hand Ø 32 Ball Screws
rolled

Order No.	Screw dia. x lead	d_1	l_1	Lead w_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.32L-10-5500	32x10	33.08	5500	10	32	29.9	$7{,}25x10^{-4}$	14.95
L1375.32L-10-6000	32x10	33.08	6000	10	32	29.9	$7{,}25x10^{-4}$	17.94



L1375.40L

Material
Steel (CF53 or C55R), induction hardened to 60 HRC ±2, polished.

Technical Notes
Gothic profile with a 5,10 or 20mm lead. Tolerance T7 - 50µ/300mm. Shorter lengths or longer lengths up to a maximum of 6000mm available.

For ball screw nuts see parts L1370.L & L1371.L - these are left hand nuts.
For end screw machining to suit ball screw support units see relevant ball screw supports (L1388-L1406). End machining on request.

Tips
These are non-standard left hand thread ball screws.

Important Notes
Ensure the ball nut can be fitted to the ball screw after machining. Do not remove the ball nut from the sleeve prior to installation - the balls come free rendering the ball nut unusable.

Order No.	Screw dia. x lead	d_1	l_1	Lead w_1	d_2	d_3	Mass moment of inertia kg·m²	Weight kg
L1375.40L-05-0500	40x 5	41.08	500	5	40	37.9	$1{,}81x10^{-3}$	4.72
L1375.40L-05-0600	40x 5	41.08	600	5	40	37.9	$1{,}81x10^{-3}$	5.66
L1375.40L-05-0800	40x 5	41.08	800	5	40	37.9	$1{,}81x10^{-3}$	7.55
L1375.40L-05-1000	40x 5	41.08	1000	5	40	37.9	$1{,}81x10^{-3}$	9.44
L1375.40L-05-1500	40x 5	41.08	1500	5	40	37.9	$1{,}81x10^{-3}$	14.16
L1375.40L-05-2000	40x 5	41.08	2000	5	40	37.9	$1{,}81x10^{-3}$	18.88
L1375.40L-05-2500	40x 5	41.08	2500	5	40	37.9	$1{,}81x10^{-3}$	23.60
L1375.40L-05-3000	40x 5	41.08	3000	5	40	37.9	$1{,}81x10^{-3}$	28.32
L1375.40L-05-3500	40x 5	41.08	3500	5	40	37.9	$1{,}81x10^{-3}$	7.55
L1375.40L-05-4000	40x 5	41.08	4000	5	40	37.9	$1{,}81x10^{-3}$	9.44
L1375.40L-05-4500	40x 5	41.08	4500	5	40	37.9	$1{,}81x10^{-3}$	14.16
L1375.40L-05-5000	40x 5	41.08	5000	5	40	37.9	$1{,}81x10^{-3}$	18.88
L1375.40L-05-5500	40x 5	41.08	5500	5	40	37.9	$1{,}81x10^{-3}$	23.60
L1375.40L-05-6000	40x 5	41.08	6000	5	40	37.9	$1{,}81x10^{-3}$	28.32
L1375.40L-10-0500	40x10	42.15	500	10	40	35.8	$1{,}66x10^{-3}$	4.51
L1375.40L-10-0600	40x10	42.15	600	10	40	35.8	$1{,}66x10^{-3}$	5.41
L1375.40L-10-0800	40x10	42.15	800	10	40	35.8	$1{,}66x10^{-3}$	7.22
L1375.40L-10-1000	40x10	42.15	1000	10	40	35.8	$1{,}66x10^{-3}$	9.02
L1375.40L-10-1500	40x10	42.15	1500	10	40	35.8	$1{,}66x10^{-3}$	13.53
L1375.40L-10-2000	40x10	42.15	2000	10	40	35.8	$1{,}66x10^{-3}$	18.04
L1375.40L-10-2500	40x10	42.15	2500	10	40	35.8	$1{,}66x10^{-3}$	22.55
L1375.40L-10-3000	40x10	42.15	3000	10	40	35.8	$1{,}66x10^{-3}$	27.06
L1375.40L-10-3500	40x10	41.08	3500	10	40	37.9	$1{,}81x10^{-3}$	7.55
L1375.40L-10-4000	40x10	41.08	4000	10	40	37.9	$1{,}81x10^{-3}$	9.44
L1375.40L-10-4500	40x10	41.08	4500	10	40	37.9	$1{,}81x10^{-3}$	14.16
L1375.40L-10-5000	40x10	41.08	5000	10	40	37.9	$1{,}81x10^{-3}$	18.88
L1375.40L-10-5500	40x10	41.08	5500	10	40	37.9	$1{,}81x10^{-3}$	23.60
L1375.40L-10-6000	40x10	41.08	6000	10	40	37.9	$1{,}81x10^{-3}$	28.32

Ball Screws

Selecting a suitable size

When selecting a ball screw some of the main factors to consider are:

- Maximum required travel speed
- Maximum axial compression (buckling load)
- Method of support of the ball screws
- Type of unit required, flanged, cylindrical etc.

In general it is best to support the ball screws with our ball screw support units (L1388 to L1406) with a fixed end (generally where the motor is mounted) and a floating (support) end. The support units are selected to suit the loads likely to be required, the size of the ball screw (especially its core diameter) and the type of mounting required. Details of the machining required for each end of the ball screw are shown in the bearing mounts technical section.

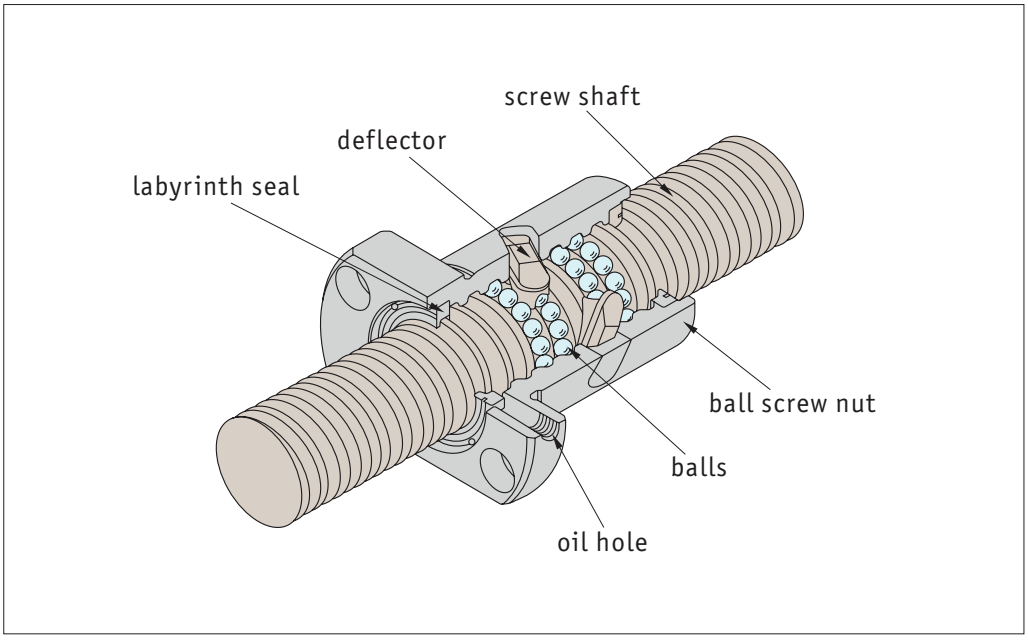
The data table for the ball screws show the diameter, the lead of the ball screw (i.e. how far the nut travels for one complete revolution of the screw) as well as the mass moment of inertia (also known as the rotational moment of inertia) - this is the extent to which an object resists rotational acceleration about its axis.

Maximum speeds and buckling load data are shown in the technical pages.

When using a ball screw the ambient temperature should not exceed +80°C.

During assembly, the parallel alignment of the guides should be ensure.

The details on the concentricity of the ball nuts to the ball screws are shown on the technical pages. For linear guideways for use with ball screws please see our part numbers L1016 etc.



Lubrication - the ball screws must be adequately lubricated. This is dependent on load, speed, motion sequence and temperature. Do not use lubricants containing Mo/So or graphite.

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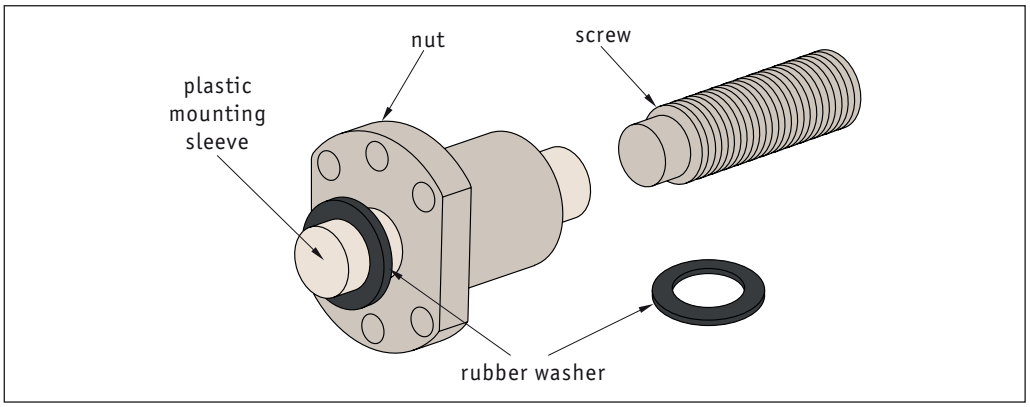
In general, the ball nut is already on the ball screw and should not be removed. If you need to machine the ball screw, then the plastic mounting sleeve should be used to retain the ball bearings whilst the nut is removed.

Mounting the nut on the screw

Sometimes ball screws are delivered with a separate ball nut. When mounting the nut on to the screw take care as if done incorrectly the ball bearings may come off the ball nut.



Ball nuts should be mounted only with the help of a plastic mounting sleeve (delivered with the nut). The start of the thread should be aligned so that the seal and the internal parts of the nut are not damaged.

1. Remove the rubber washer from one side of the sleeve. Push on the nut with the sleeve on the end of the screw. Press the sleeve against the start of the screw thread.
2. Screw the nut onto the thread using a slight axial pressure, then screw the nut on for it's entire length.
3. Remove the mounting sleeve only when the nut is completely threaded on to the screw.
4. Lock the nut on to the screw (to prevent any unscrewing) using an O ring or similar - whilst installing the system.

If the balls do unfortunately escape...

1. Pick them up (the nut is only compatible with the original balls). The load capacity can still be achieved if one or two balls are missing.
2. Carefully clean all parts, use the sleeve as a mounting jig and replace the balls.
3. Start with the lowest circuit. Insert the balls into the nut circuit - the sleeve prevents the balls from falling out again.
4. Do not place the balls in the empty circuit located between the two deflectors.

If you have any technical queries please call **0333 207 4498.**